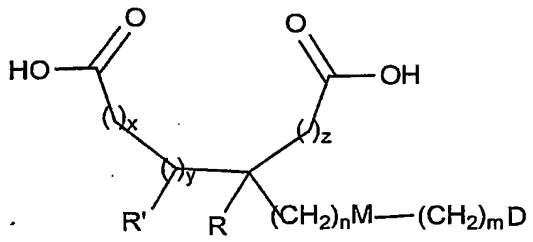
CLAIMS:

1. A method for selective targeting a compound to a cell undergoing *p*erturbation of the *n*ormal *o*rganization of its plasma *m*embrane (PNOM-cell), comprising the steps of:

(i) contacting a cell population comprising said PNOM-cell with a compound or a conjugate comprising said compound, wherein said compound is represented by the structure set forth in formula (I):

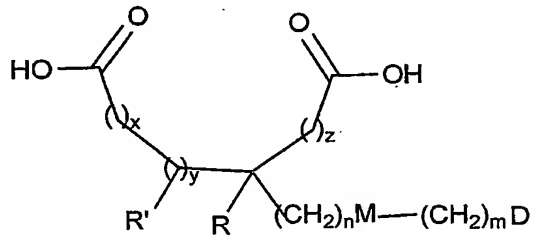


including pharmaceutically acceptable salts, metal chelates, solvates and hydrates of the compound represented by the structure as set forth in formula (I), and solvates and hydrates of the salts; wherein each of R and R' groups is independently selected at each occurrence from hydrogen, C_1, C_2, C_3, C_4, C_5, C_6, C_7, C_8, C_9, C_{10}, C_{11}, C_{12}, C_{13}, C_{14}, C_{15}, C_{16}, linear or branched alkyl, linear or branched hydroxy-alkyl, linear or branched fluoro-alkyl, aryl or heteroaryl composed of one or two rings, or combinations thereof; n and m each stands for an integer of 0, 1, 2, 3 or 4; n and m may be same or different; M is selected from null, hydrogen, -O-, -S-, and –N(U), wherein U stands for hydrogen, or C_1, C_2, C_3, or C_4 alkyl; x, and z each stands independently and is an integer of 0, 1 or 2, where x and z can be the same or different; y is an integer of 0, 1 or 2, where when y=2 the substituent R' may be the same or different at each occurrence; and D is a marker for diagnostics, hydrogen, hydroxyl, F or a drug;

(ii) thereby selectively targeting said compound to said PNOM-cell within said cell population.

2. A method of detecting a PNOM-cell within a cell population, said method comprising:

(i) contacting the cell population with a compound or a conjugate comprising said compound wherein said compound is represented by the structure set forth in formula (I):

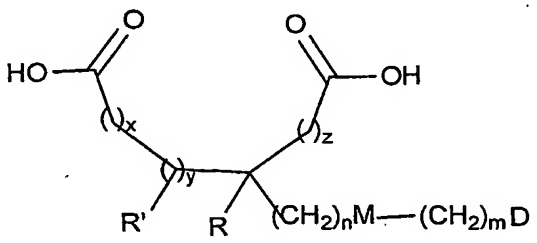


including pharmaceutically acceptable salts, metal chelates, solvates and hydrates of the compound represented by the structure as set forth in formula (I), and solvates and hydrates of the salts; wherein each of R and R' groups is independently selected at each occurrence from hydrogen, C_1, C_2, C_3, C_4, C_5, C_6, C_7, C_8, C_9, C_{10}, C_{11}, C_{12}, C_{13}, C_{14}, C_{15}, C_{16}, linear or branched alkyl, linear or branched hydroxy-alkyl, linear or branched fluoro-alkyl, aryl or heteroaryl composed of one or two rings, or combinations thereof; n and m each stands for an integer of 0, 1, 2, 3 or 4; n and m may be same or different; M is selected from null, hydrogen, -O-, -S-, and –N(U), wherein U stands for hydrogen, or C_1, C_2, C_3, or C_4 alkyl; x, and z each stands independently for an integer of 0, 1 or 2, where x and z can be the same or different; y is an integer of 0, 1 or 2, where when y=2 the substituent R' may be the same or different at each occurrence; and D is a marker for diagnostics; and

(ii) determining the amount of said compound bound to said cells, wherein a significant amount of said compound bound to a cell indicates its being a PNOM-cell.

3. A method for detecting of PNOM-cells in a patient or an animal, comprising:

(i). administering a compound or a conjugate comprising said compound wherein said compound is represented by the structure set forth in formula (I):

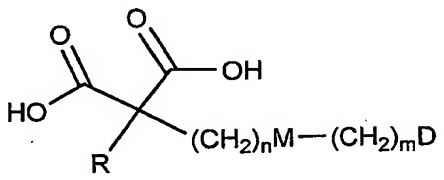


including pharmaceutically acceptable salts, metal chelates, solvates and hydrates of the compound represented by the structure as set forth in formula (I), and solvates and hydrates of the salts; wherein each of R and R' groups is independently selected at each occurrence from hydrogen, C_1, C_2, C_3, C_4, C_5, C_6, C_7, C_8, C_9, C_{10}, C_{11}, C_{12}, C_{13}, C_{14}, C_{15}, C_{16}, linear or branched alkyl, linear or branched hydroxy-alkyl, linear or branched fluoro-alkyl, aryl or heteroaryl composed of one or two rings, or combinations thereof; n and m each stands for an integer of 0, 1, 2, 3 or 4; n and m may be same or different; M is selected from null, hydrogen, -O-, -S-, and –N(U), wherein U stands for hydrogen, or C_1, C_2, C_3, or C_4 alkyl; x, and z each stands independently for an integer of 0, 1 or 2, where x and z can be the same or different; y is an integer of 0, 1 or 2, where when y=2 the substituent R' may be the same or different at each occurrence; and D is a marker for diagnostics, hydrogen, hydroxyl, F or a drug; and

(ii) imaging the human or animal, so as determine the amount of said compound bound to cells, wherein a significant amount of said compound bound a cell indicates its being a PNOM-cell.

4. A method for selective targeting of a compound to a cell undergoing *p*erturbation of the *n*ormal *o*rganization of its plasma *m*embrane (PNOM-cell), comprising the steps of:

(i). contacting a cell population comprising said PNOM-cell with a compound or a conjugate comprising said compound, wherein said compound is represented by the structure as set forth in formula (II):



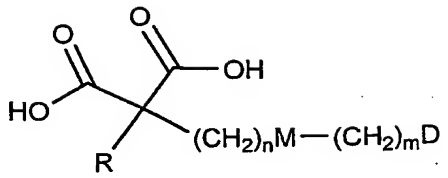
II

including pharmaceutically acceptable salts, hydrates, solvates and metal chelates of the compound represented by the structure as set forth in formula (II) and solvates and hydrates of the salts; wherein R represents hydrogen or C_1, C_2, C_3, C_4, C_5, C_6, C_7, C_8, C_9, C_{10}, C_{11}, C_{12}, C_{13}, C_{14}, C_{15}, C_{16}, linear or branched alkyl, linear or branched hydroxy-alkyl, linear or branched fluoro-alkyl, aryl or heteroaryl composed of one or two rings, or combinations thereof; n and m each stands for an integer of 0, 1, 2, 3 or 4; n and m may be same or different; M is selected from null, hydrogen, -O-, -S-, and –N(U), wherein U stands for hydrogen, C_1, C_2, C_3, or C_4 alkyl; D is a marker for diagnostics, hydrogen or a drug;

(ii). thereby selectively targeting said compound to said PNOM-cell within said cell population.

5. A method of detecting a PNOM-cell within a cell population, said method comprising:

(i) contacting the cell population with a compound or a conjugate comprising said compound wherein said compound is represented by the structure as set forth in formula (II):



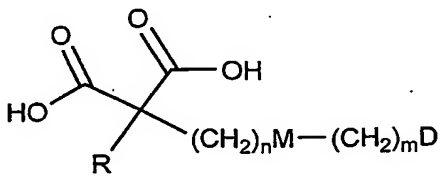
II

including pharmaceutically acceptable salts, hydrates, solvates and metal chelates of the compound represented by the structure as set forth in formula (II) and solvates and hydrates of the salts; wherein R represents hydrogen or C_1, C_2, C_3, C_4, C_5, C_6, C_7, C_8, C_9, C_{10}, C_{11}, C_{12}, C_{13}, C_{14}, C_{15}, C_{16}, linear or branched alkyl, linear or branched hydroxy-alkyl, linear or branched fluoro-alkyl, aryl or heteroaryl composed of one or two rings, or combinations thereof; n and m each stands for an integer of 0, 1, 2, 3 or 4; n and m may be same or different; M is selected from null, hydrogen, -O-, -S-, and –N(U), wherein U stands for a null, hydrogen, C_1, C_2, C_3, or C_4 alkyl; D is a marker for diagnostics; and

(ii) determining the amount of said compound bound to said cells, wherein a significant amount of said compound bound to a cell indicates its being a PNOM-cell.

6. A method for detecting of PNOM-cells in a patient or an animal, comprising:

(i). administering a compound or a conjugate comprising said compound wherein said compound is represented by the structure as set forth in formula (II):

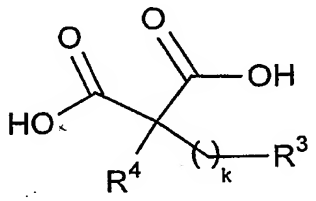


II

including pharmaceutically acceptable salts, hydrates, solvates and metal chelates of the compound represented by the structure as set forth in formula (II) and solvates and hydrates of the salts; wherein R represents hydrogen or C_1, C_2, C_3, C_4, C_5, C_6, C_7, C_8, C_9, C_{10}, C_{11}, C_{12}, C_{13}, C_{14}, C_{15}, C_{16}, linear or branched alkyl, linear or branched hydroxy-alkyl, linear or branched fluoro-alkyl, aryl or heteroaryl composed of one or two rings, or combinations thereof; n and m each stands for an integer of 0, 1, 2, 3 or 4; n and m may be same or different; M is selected from null, hydrogen, -O-, -S-, and –N(U), wherein U stands for hydrogen, C_1, C_2, C_3, or C_4 alkyl; D is a marker for diagnostics; and

(ii) imaging the human or animal, so as to determine the amount of said compound bound to cells, wherein a significant amount of said compound bound to cells indicates its being a PNOM-cell.

7. A method according to any one of claims 4-6, wherein said compound is represented by the structure as set forth in formula (III):

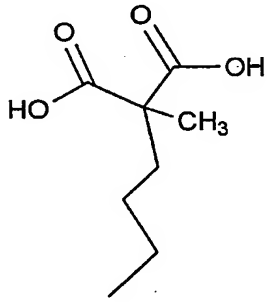


III

including pharmaceutically acceptable salts, hydrates, solvates and metal chelates of the compound represented by the structure as set forth in formula (III) and solvates and hydrates of the salts; wherein R^3 is hydroxyl or F; R^4 is selected from C_4, C_5, C_6,

C_7, C_8, C_9 or C_{10} linear or branched alkyl, and k is an integer selected from 0, 1, 2, 3, 4 and 5.

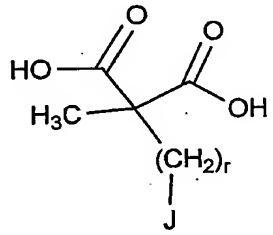
8. A compound represented by the structure as set forth in formula (IV):



IV

including pharmaceutically acceptable salts, hydrates, solvates and metal chelates of the compound represented by the structure as set forth in formula (IV) and solvates and hydrates of said salts.

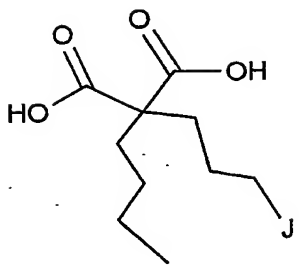
9. A compound represented by the structure as set forth in formula (V):



V

including pharmaceutically acceptable salts, hydrates, solvates and metal chelates of the compound represented by the structure as set forth in formula (V) and solvates and hydrates of the salts; wherein J is selected from -F and –OH, and r stands for an integer of 4,5,6,7,8,9,10.

10. A compound represented by the structure as set forth in formula (VI):

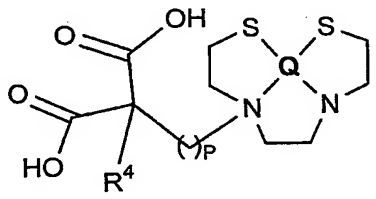


VI

including pharmaceutically acceptable salts, hydrates, solvates and metal chelates of the compound represented by the structure as set forth in formula (VI) and solvates and hydrates of said salts; wherein J is selected from hydrogen, F and OH.

11. A compound according to claim 10 wherein J is F.

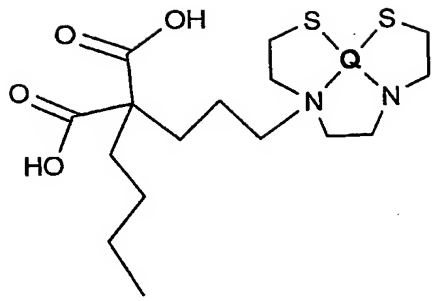
12. A compound represented by the structure set forth in formula VII:



VII

including pharmaceutically acceptable salts, hydrates and solvates of the compound represented by the structure as set forth in formula (VII) and solvates and hydrates of said salts, wherein Q is selected from technetium, oxo-technetium, rhenium and oxo-rhenium, R^4 is selected from hydrogen, C_1, C_2, C_3, C_4, C_5, and C_6 linear or branched alkyl, and p stands for an integer, selected from 1, 2, 3, 4 and 5.

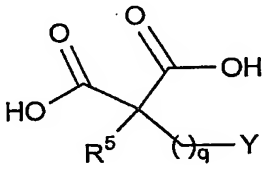
13. A compound according to claim 12 represented by the structure set forth in formula VIII:



VIII

including pharmaceutically acceptable salts, hydrates and solvates of the compound represented by the structure as set forth in formula (VIII) and solvates and hydrates of said salts, wherein Q is selected from technetium, oxo-technetium, rhenium and oxo-rhenium.

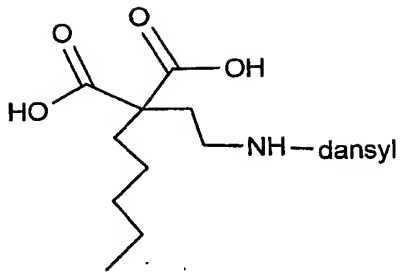
14. Method according to any one of claims 4-6, wherein said compound is represented by the structure as set forth in formula (IX):



IX

including pharmaceutically acceptable salts, hydrates, solvates and metal chelates of the compound represented by the structure as set forth in formula (IX) and solvates and hydrates of said salts; wherein R^5 is selected from hydrogen, C_1, C_2, C_3, C_4, C_5, and C_6 linear or branched alkyl, C_1, C_2, C_3, C_4, C_5, and C_6 linear or branched fluoro-alkyl, and C_1, C_2, C_3, C_4, C_5, and C_6 linear or branched hydroxy-alkyl; q stands for an integer, selected from 1, 2, 3, 4 and 5; and Y is a marker for fluorescence.

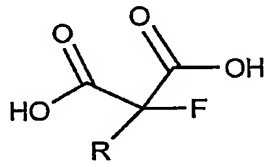
15. A compound represented by the structure as set forth in formula (X):



X

including pharmaceutically acceptable salts, hydrates, solvates and metal chelates of the compound represented by the structure as set forth in formula (X) and solvates and hydrates of said salts.

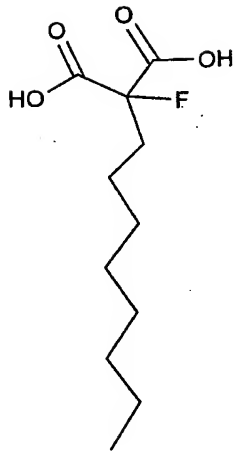
16. A method according to any one of claims 4-6, wherein said compound is represented by the structure as set forth in formula (XI):



XI

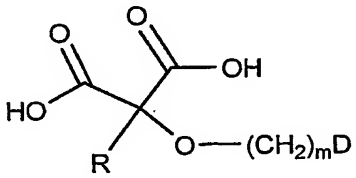
including pharmaceutically acceptable salts, hydrates, solvates and metal chelates of the compound represented by the structure as set forth in formula (XI) and solvates and hydrates of the salts; wherein R represents hydrogen or C_1, C_2, C_3, C_4, C_5, C_6, C_7, C_8, C_9, C_{10}, C_{11}, C_{12}, C_{13}, C_{14}, C_{15}, C_{16}, linear or branched alkyl, linear or branched hydroxy-alkyl, linear or branched fluoro-alkyl, aryl or heteroaryl composed of one or two rings, or combinations thereof.

17. A compound represented by the structure set forth in formula (XII):



including pharmaceutically acceptable salts, hydrates, solvates and metal chelates of the compound represented by the structure as set forth in formula (XII) and solvates and hydrates of the salts; wherein F is ^{18}F or ^{19}F.

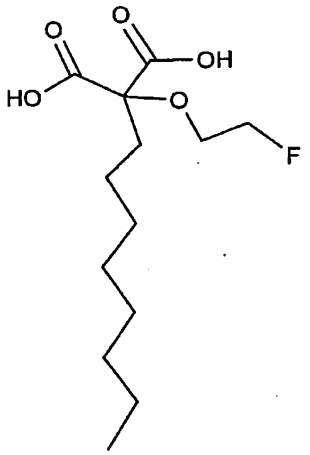
18. A compound represented by the structure set forth in formula XIII



XIII

including pharmaceutically acceptable salts hydrates, solvates and metal chelates of the compound represented by the structure as set forth in formula (XIII) and solvates and hydrates of the salts; R represents hydrogen or C_1, C_2, C_3, C_4, C_5, C_6, C_7, C_8, C_9, C_{10}, C_{11}, C_{12}, C_{13}, C_{14}, C_{15}, C_{16}, linear or branched alkyl, linear or branched hydroxy-alkyl, linear or branched fluoro-alkyl, aryl or heteroaryl composed of one or two rings, or combinations thereof; m stands for an integer of 0, 1, 2, 3 or 4; D is a marker for diagnostics or a drug to be targeted to the PNOM cells.

19. A compound represented by the structure set forth in formula (XIV):



XIV

including pharmaceutically acceptable salts, hydrates, solvates and metal chelates of the compound represented by the structure as set forth in formula (XIV) and solvates and hydrates of the salts; wherein F may be ^{18}F or ^{19}F.

20. A compound according to the structure set forth in formulae I, II, III, IV, V, VI, VII, VIII, IX, X, XI, XII, XIII, or XIV, comprising or being linked to a marker for imaging, wherein said marker for imaging is Tc, Tc=O, In, Cu, Ga, Xe, Tl, Re and Re=O , ^{123}I , ^{131}I , Gd(III), Fe(III), Fe_2O_3, Fe_3O_4, Mn(II) ^{18}F, ^{15}O, ^{18}O, ^{11}C, ^{13}C, ^{124}I, ^{13}N, ^{75}Br, Tc-99m or In-111.

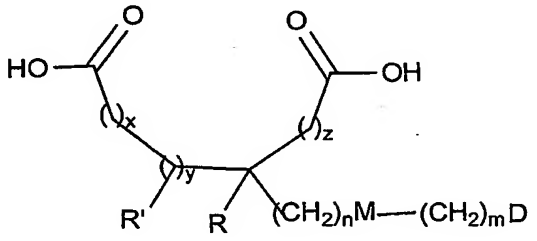
21. Pharmaceutical or diagnostic composition comprising as an active ingredient an effective amount of a compound as defined in any one of claims 8-13, 15, 17, 18 and 19 and a pharmaceutically or diagnostically acceptable carrier.

22. Pharmaceutical composition for targeting of drugs to foci of apoptosis or blood clotting in a human or non-human patient, wherein the pharmaceutical composition comprises as an active ingredient a compound according to the structure set forth in formulae I, II, III, IV, V, VI, VII, VIII, IX, X, XI XII, XIII, or

XIV wherein the compound comprises or is being linked to a drug, together with a pharmaceutically acceptable carrier.

23. A method of detecting apoptotic cells within a tumor in a suspected body area of an examined subject, said method comprising:

(i) administering a compound or a conjugate comprising said compound, wherein said compound is represented by the structure set forth in formula (I):



or pharmaceutically acceptable salts, metal chelates, solvates and hydrates of the compound represented by the structure as set forth in formula (I), and solvates and hydrates of the salts; wherein each of R and R' groups is independently selected at each occurrence from hydrogen C_1, C_2, C_3, C_4, C_5, C_6, C_7, C_8, C_9, C_{10}, C_{11}, C_{12}, C_{13}, C_{14}, C_{15}, C_{16}, linear or branched alkyl, linear or branched hydroxy-alkyl, linear or branched fluoro-alkyl, aryl or heteroaryl composed of one or two rings, or combinations thereof; n and m each stands for an integer of 0, 1, 2, 3 or 4; n and m may be same or different; M is selected from null, hydrogen, -O-, -S-, and –N(U), wherein U stands for hydrogen, or C_1, C_2, C_3, or C_4 alkyl; x, and z each stands independently and is an integer of 0, 1 or 2, where x and z can be the same or different; y is an integer of 0, 1 or 2, where when y=2 the substituent R' may be the same or different at each occurrence; and D is a marker for diagnostics; and

(ii) determining the amount of said compound bound to cells in the tumor or in the organ comprising the tumor, wherein a significant amount of said

compound bound to cells in a suspected area indicates that these tumor cells are undergoing apoptosis.

24. A method for targeting anticancer drugs to a tumor which has foci of apoptotic cells, said method comprising the step of administering a compound as set forth in any of the formulae I, II, III, IV, V, VI, VII, VIII, IX, X, XI, XII, XIII, or XIV, comprising or being linked to a cytotoxic drug, thereby achieving targeting of said drug to the foci of cell death within the tumor.

25. A method of targeting an anticoagulant or a fibrinolytic agent to a blood clot, comprising the step of administering a compound as set forth in any of the formulae I, II, III, IV, V, VI, VII, VIII, IX, X, XI, XII, XIII, or XIV, comprising said anticoagulant or fibrinolytic agent, thereby achieving targeting of said drug to the blood clot.

26. The method according to any one of claims 1-6, wherein said marker for diagnostics is a marker for imaging, or a labeled metal chelate, wherein said marker for imaging or chelated metal may be detected by color, fluorescence, x-ray, CT scan, magnetic resonance imaging (MRI), or radio-isotope scan, om single photon emission tomography (SPECT) or positron emission tomography (PET).

27. The method according to any one of claims 1-6 and 22-26 wherein said marker of imaging is ^{18}F.